

- c. an ion producing arrangement controlling energy of produced ions;
- d. a mass separator;
- e. an electron gun;
- f. an electron detector receiving secondary electrons;
- g. a holding arrangement for the semiconductor wafer;
- h. an ion current meter;
- i. an ion beam transport column;
- j. a quadrupole mass analyzer;
- k. an optical microscope; and
- l. a computer,

wherein a first axis of the ion beam transport column, a second axis of the optical microscope and a third axis of the electron gun are situated in a particular plane, the particular plane being substantially normal to a plane in which the semiconductor wafer is held by the holding arrangement when in a working position, the first, second and third axes intersecting at a particular point located on a first surface of the semiconductor wafer, and

wherein the computer controls scanning of an ion beam through a set of sites on the semiconductor wafer by moving the semiconductor wafer through predetermined site coordinates, the computer further displaying images of the first surface as a function of the secondary electrons received by the electron detector, the secondary electrons being generated by one of the ion beam and a scanning electron beam, the computer further superimposing a first raster of the ion beam and a second raster of the scanning electron beam on the images of the first surface.

- 5. (New) The system according to claim 4, wherein the ion beam transport column, the optical microscope and the electron gun face the first surface.
- 6. (New) The system according to claim 5, wherein an angle between the first, second and third axes is a minimal angle.
- 7. (New) The system according to claim 4, wherein the vacuum chamber achieves a